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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/652,348	08/29/2003	Franklin J. Wall JR.	LUM-03-06-10	1306

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PATENT LAW GROUP LLP
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SUITE 223
SAN JOSE, CA 95134

EXAMINER

FARAHANI, DANA

ART UNIT	PAPER NUMBER
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2891

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.		Applicant(s)	
	10/652,348		WALL, FRANKLIN J.	
	Examiner		Art Unit	
	Dana Farahani		2891	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 5/4/07.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) 18-22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 and 23-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3-6, 8, 14, 16, 17, 23, 25 and 26 are rejected under 35 U.S.C. 102(b) as being anticipated by Dolan (US Patent 4,566,170), previously cited.

2. Claims are rejected under 35 U.S.C. 103(a) as being unpatentable over

Regarding claims 1, 8, 16, 17, and 23, Dolan discloses, fig. 2, a structure comprising:

a semiconductor light emitting device (LED) 18;

a substrate comprising a ceramic core 12 and at least one copper layer 14 overlying the core having a thickness of at least 4 mils (see column 3, line 3);

wherein the LED is electrically connected to the at least one copper layer and wherein a path from the at least one copper layer to the ceramic core is thermally conductive. A bond 16 disposed between the at least one copper layer and the core is an active metal braze.

Regarding claim 3, the ceramic core is Al₂O₃ (see col. 2, line 29).

Regarding claim 4, at least one lead 24 is connected to the substrate.

Regarding claim 5, at least one solder pad 20 is connected to the substrate (figure 3).

Regarding claim 6, at least one terminated wire 24 is connected to the substrate.

Regarding claim 14, a base, a copper layer other than the one discussed above, is connected to the substrate.

Regarding claims 25 and 26, the operating of the light emitting package at claimed conditions, is inherent to the structure of Dolan, since Dolan discloses all the structural claimed limitations.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dolan as applied to claim 1 above, and further in view of Applicant's Admitted Prior Art (AAPA), previously cited.

Dolan discloses the limitations in the claims, but does not disclose the light-emitting element has a III-nitride light-emitting layer.

AAPA discloses that III-nitride light emitters are known and used in the art (paragraph 2) and further discloses a silicon ESD protection integrated circuit 2 is formed beneath the LED 1 (see fig. 1, and paragraph 3). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use a III-nitride type light emitter layer, in order to emit any color of desired light (i.e. UV-red) or combinations thereof (e.g. white).

5. Claims 7 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dolan as applied to claim 1 above, and further in view of Kuhnert et al., hereinafter Kuhnert (US Patent 5,379,942), newly cited.

Dolan discloses the claimed invention, as discussed above, except for a bond disposed between the at least one copper layer and the core is a direct copper bond.

Kuhnert discloses that a direct copper bond is used between the ceramic substrate 2 and copper 3 of figure 1 (see column 2, lines 40-44). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use this type of bonding to bond the ceramic and the copper layer of the Dolan reference, since it would save cost by eliminating use of silver layer 16 in that reference.

6. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dolan.

Dolan discloses the claimed invention, as discussed above, except for the copper layer has a thickness between 4 mils and 24 mils. However, as discussed above, Dolan discloses a thickness of between 30-60 mils. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to reduce the thickness of the copper layer to, for example, 24 mils, since it is negligibly close to the range disclose by Dolan, and to make the LED apparatus usable for various applications.

7. Claims 10-13 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dolan as applied to claim 1 above, and further in view of Whitworth et al., hereinafter Whitworth (US Patent 6,642,550), previously cited.

Regarding claims 10-13, Dolan substantially discloses the limitations in the claim, as discussed above, except for a second substrate layer between the copper substrate and the light emitting device.

Whitworth discloses in figure 3, a LED in figure 4; wherein light emitting device 310 has a ESD silicon substrate 380, with bond pad 370 and insulator silicon nitride 730 (fig. 7).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use another substrate along with the corresponding light emitting devices to protect the LEDs of the Dolan's reference from electrostatic discharge.

Regarding claim 15, Whitworth discloses the package 350 has a lens section on the top.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use a lens on the LEDs of the Dolan reference to affect the emitted light rays.

Product-by-Process Limitations

A comparison of the recited process with the prior art process does NOT serve to resolve the issue concerning patentability of the product. *In re Fessman*, 489 F2d 742, 180 USPQ 324 (CCPA 1974). Whether a product is patentable depends on whether it is known in the art or it is obvious, and is not governed by whether the process by which is made is patentable. *In re Klug*, 333 F2d 905, 142 USPQ 161 (CCPA 1964). In an ex parte case, product by process claims are not constructed as being limited to the product formed by the specific process recited. *In re Hirao et al.*, 535 F2d 67, 190 USPQ 15, see footnote 3 (CCPA 1976). Therefore, in claim 17, the process of bonding the copper layer to the core is given no patentable weight.

Response to Arguments

8. Applicant's arguments with respect to the claims have been considered but are not persuasive.

Regarding applicant's argument that the path from the at least one copper layer to the ceramic core is thermally conductive, while in Dolan a silver epoxy layer 16 connects copper

pallet 14 to substrate 12, this argument is not persuasive. Silver paste is a thermally conductive material. Moreover, the specification provides no special definition for what level of thermal conductivity constitutes “thermally conductive”. As such, arguments that silver paste is not “thermally conductive” may raise 112-2nd indefinite issues because it would not be reasonably clear what objective standards determine whether any given material is “thermally conductive”.

Applicant’s argument that according to claim 1, wherein it states a ceramic core and at least one copper layer overlying the core having a thermal conductivity of at least 24 W/m.k, is not persuasive. Because Dolan discloses the same material as the of the claimed material in this regard, they have the same thermal conductivity.

Applicant’s argument that Dolan teaches the thickness of the copper slab is 30-60 mils, which is substantially thicker than 4-24 mils claimed, the motivation and rejection of this limitation of claim 9 is addressed above. Moreover, there is no evidence that reducing the thickness of the copper of the Dolan reference could be damaging to the device, as applicant alleges.

Conclusion

9. Applicant's amendment to claim 7 necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after


the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dana Farahani whose telephone number is (571)272-1706. The examiner can normally be reached on M-F 9:00AM - 6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill Baumeister can be reached on (571)272-1722. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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